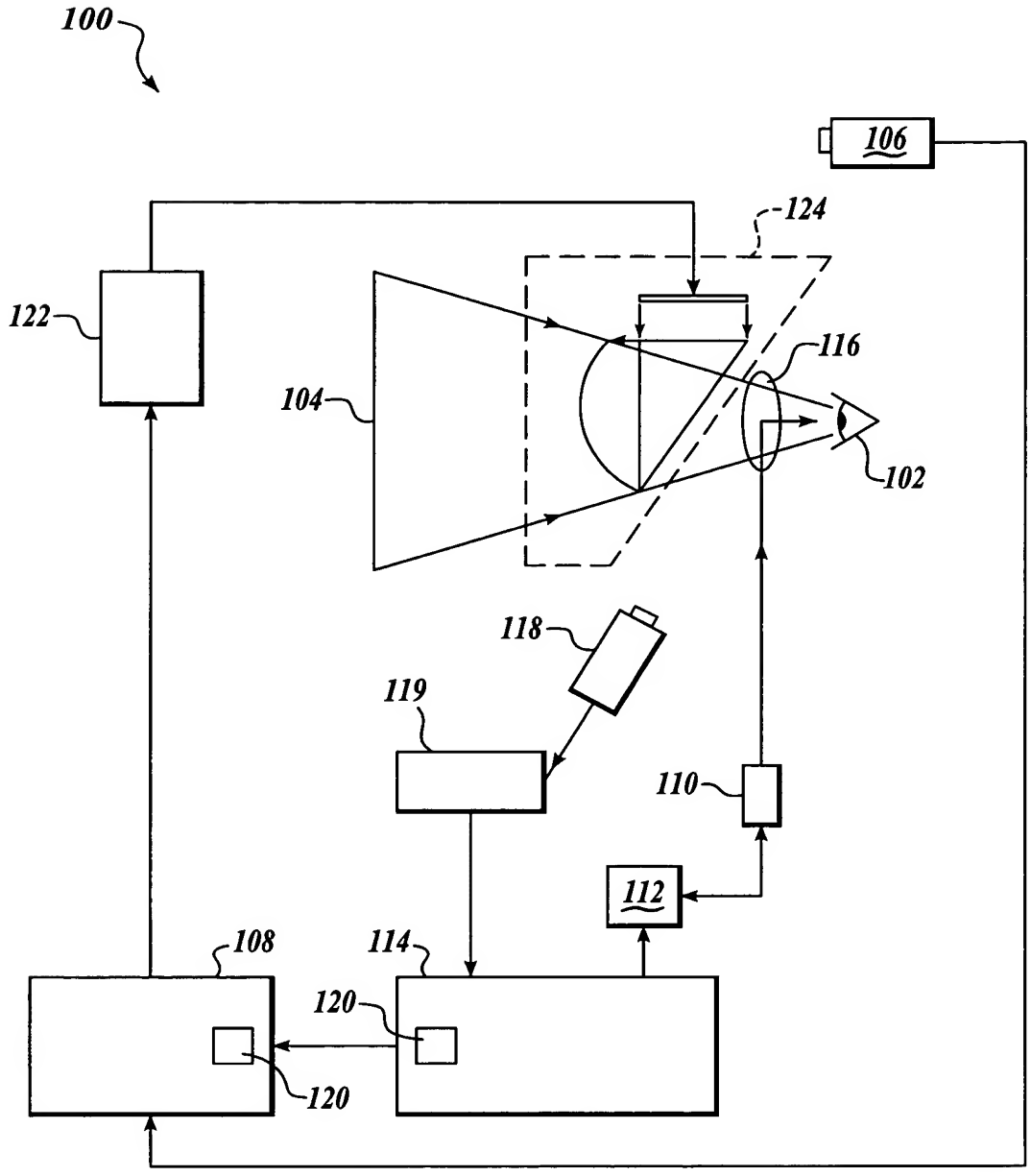

Fig. 1.

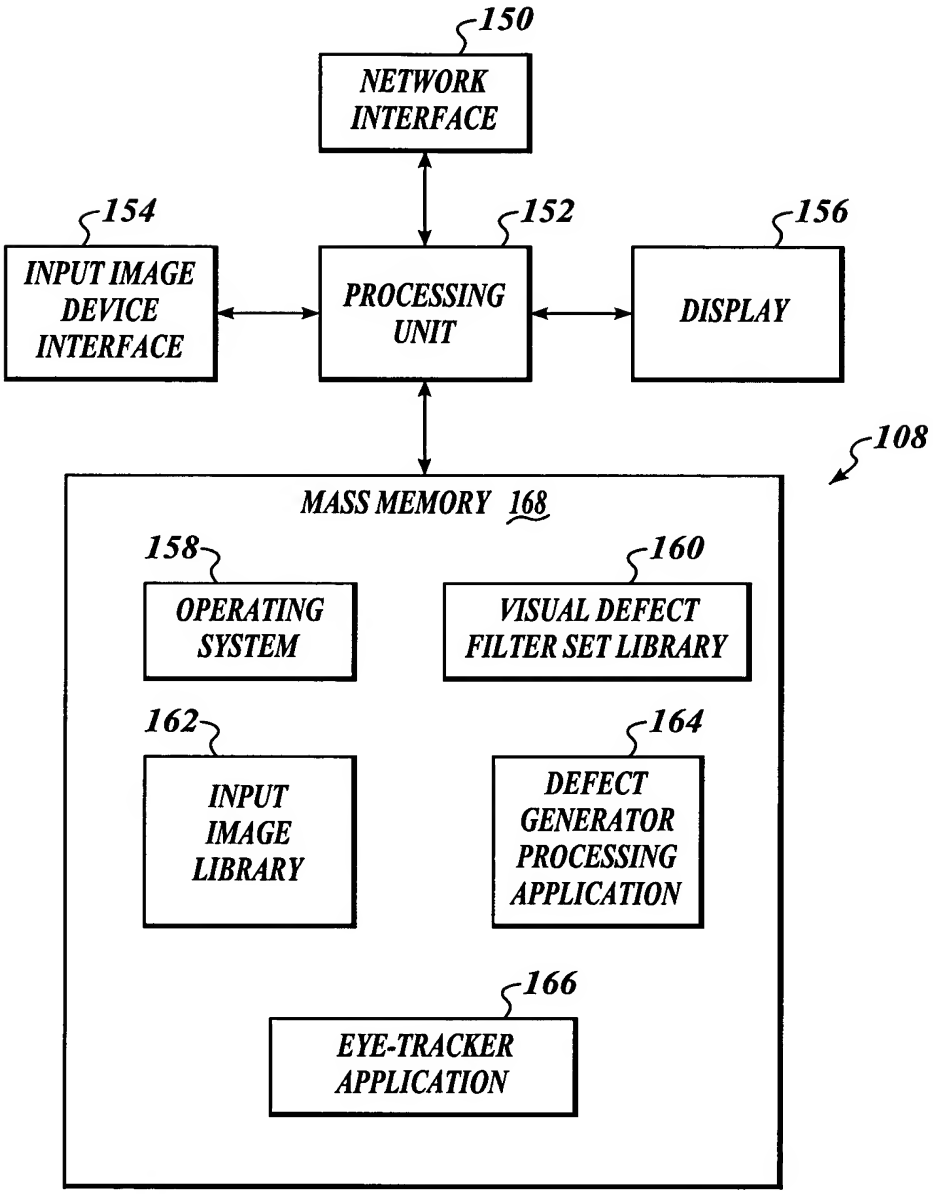
150
NETWORK INTERFACE
154
INPUT IMAGE DEVICE INTERFACE
152
PROCESSING UNIT
156
DISPLAY
108
MASS MEMORY 168
158
OPERATING SYSTEM
160
VISUAL DEFECT FILTER SET LIBRARY
162
INPUT IMAGE LIBRARY
164
DEFECT GENERATOR PROCESSING APPLICATION
166
EYE-TRACKER APPLICATION

Fig. 2.

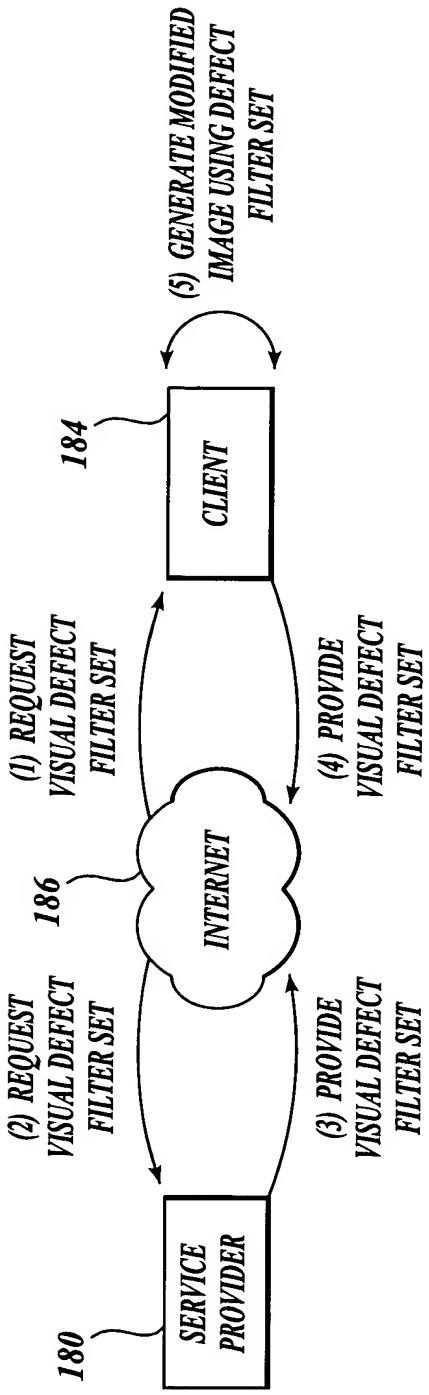
(5) GENERATE MODIFIED IMAGE USING DEFECT FILTER SET
184
CLIENT
(1) REQUEST VISUAL DEFECT FILTER SET
(4) PROVIDE VISUAL DEFECT FILTER SET
186
INTERNET
(2) REQUEST VISUAL DEFECT FILTER SET
(3) PROVIDE VISUAL DEFECT FILTER SET
180
SERVICE PROVIDER

Fig. 3.

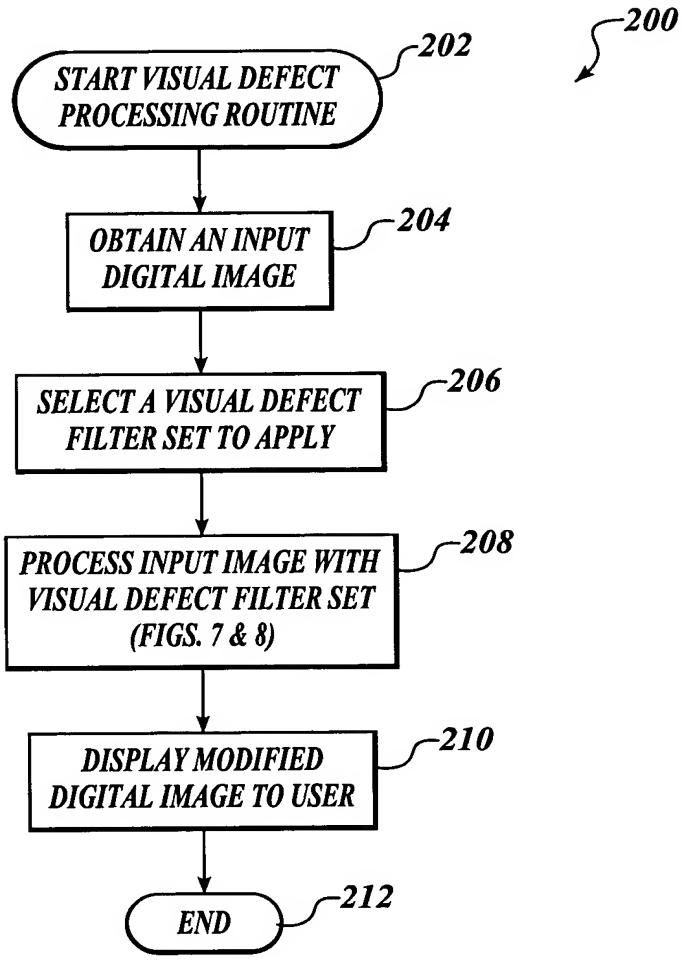
200
START VISUAL DEFECT PROCESSING ROUTINE
202
OBTAIN AN INPUT DIGITAL IMAGE
204
SELECT A VISUAL DEFECT FILTER SET TO APPLY
206
PROCESS INPUT IMAGE WITH VISUAL DEFECT FILTER SET (FIGS. 7 & 8)
208
DISPLAY MODIFIED DIGITAL IMAGE TO USER
210
END
212

Fig. 4.

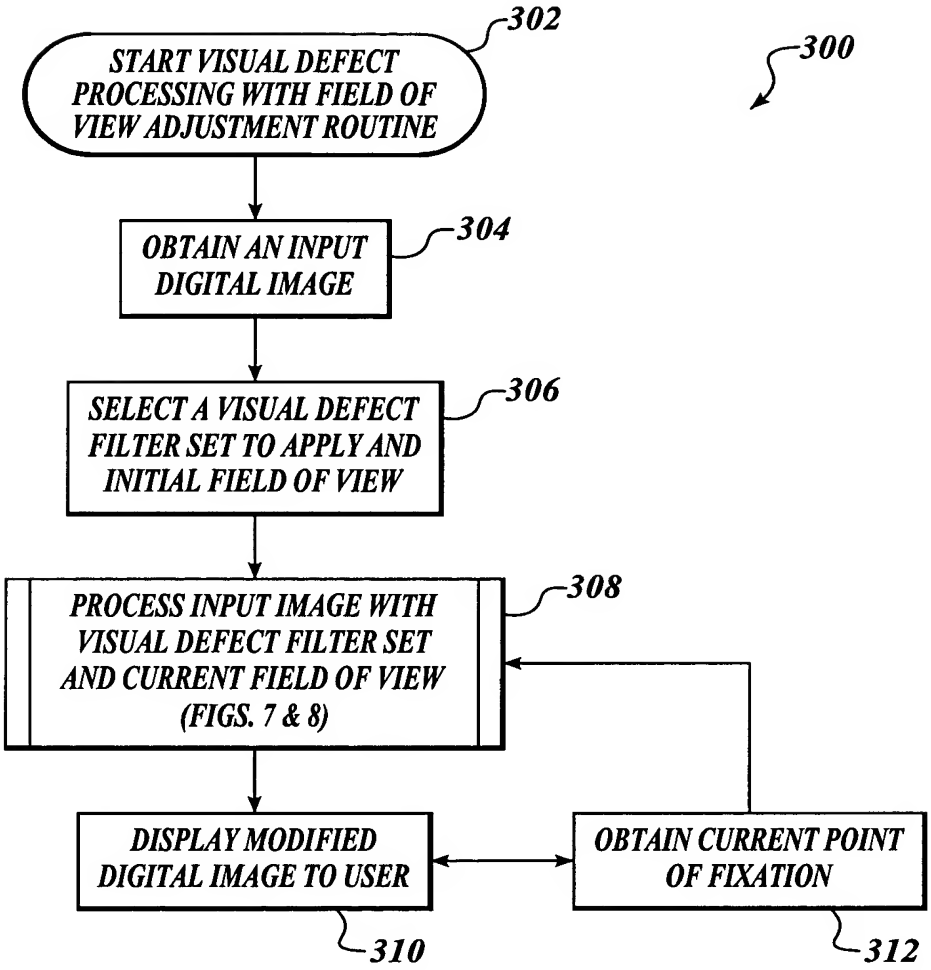
302
300
START VISUAL DEFECT PROCESSING WITH FIELD OF VIEW ADJUSTMENT ROUTINE
OBTAIN AN INPUT DIGITAL IMAGE
304
SELECT A VISUAL DEFECT FILTER SET TO APPLY AND INITIAL FIELD OF VIEW
306
PROCESS INPUT IMAGE WITH VISUAL DEFECT FILTER SET AND CURRENT FIELD OF VIEW (FIGS. 7 & 8)
308
DISPLAY MODIFIED DIGITAL IMAGE TO USER
310
OBTAIN CURRENT POINT OF FIXATION
312

Fig. 5.

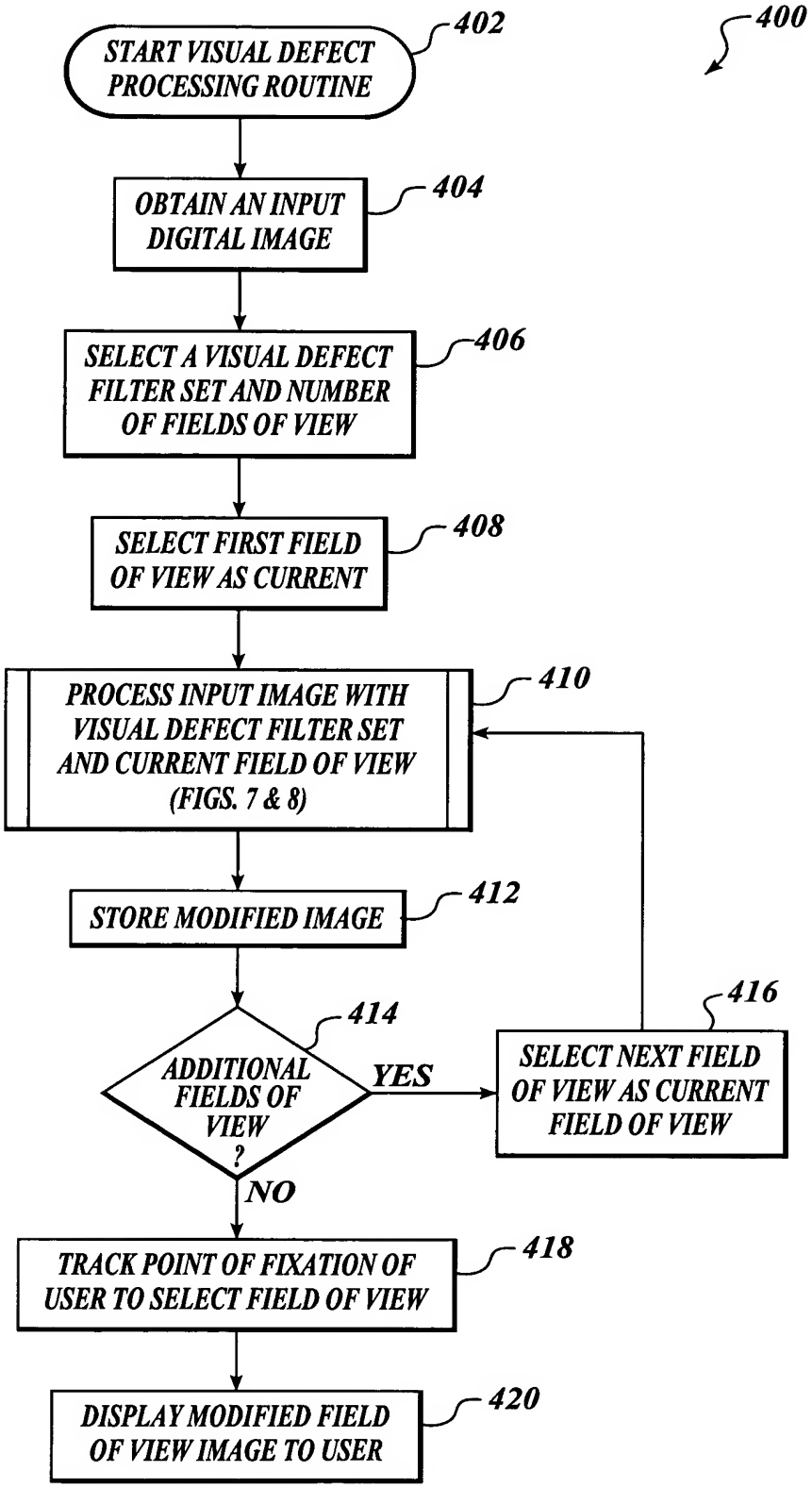
400
START VISUAL DEFECT PROCESSING ROUTINE
402
OBTAIN AN INPUT DIGITAL IMAGE
404
SELECT A VISUAL DEFECT FILTER SET AND NUMBER OF FIELDS OF VIEW
406
SELECT FIRST FIELD OF VIEW AS CURRENT
408
PROCESS INPUT IMAGE WITH VISUAL DEFECT FILTER SET AND CURRENT FIELD OF VIEW (FIGS. 7 & 8)
410
STORE MODIFIED IMAGE
412
ADDITIONAL FIELDS OF VIEW ?
414
YES
SELECT NEXT FIELD OF VIEW AS CURRENT FIELD OF VIEW
416
NO
TRACK POINT OF FIXATION OF USER TO SELECT FIELD OF VIEW
418
DISPLAY MODIFIED FIELD OF VIEW IMAGE TO USER
420

Fig. 6.

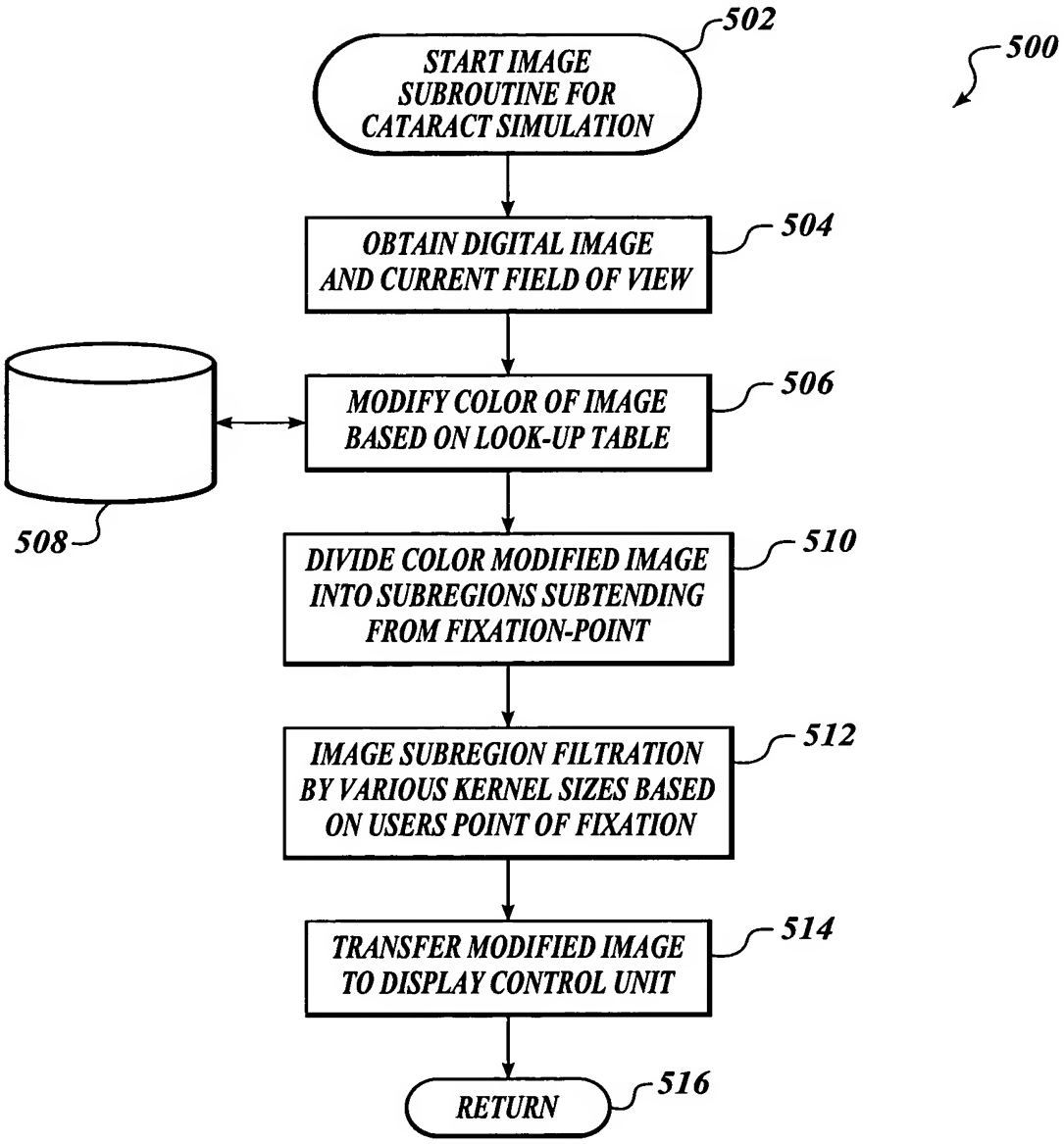
500
502
START IMAGE SUBROUTINE FOR CATARACT SIMULATION
504
OBTAIN DIGITAL IMAGE AND CURRENT FIELD OF VIEW
506
MODIFY COLOR OF IMAGE BASED ON LOOK-UP TABLE
508
510
DIVIDE COLOR MODIFIED IMAGE INTO SUBREGIONS SUBTENDING FROM FIXATION-POINT
512
IMAGE SUBREGION FILTRATION BY VARIOUS KERNEL SIZES BASED ON USERS POINT OF FIXATION
514
TRANSFER MODIFIED IMAGE TO DISPLAY CONTROL UNIT
516
RETURN

Fig. 7.

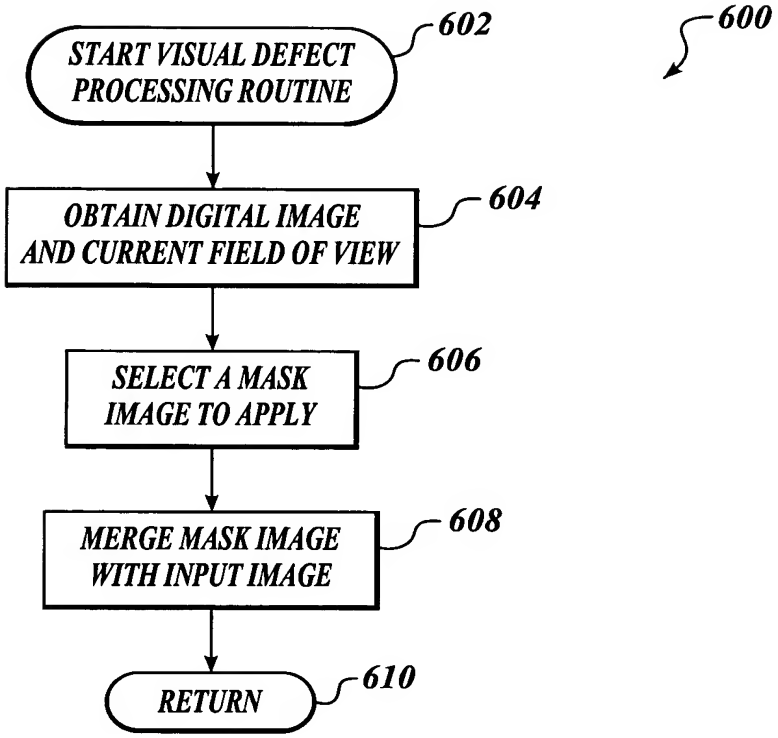
600
START VISUAL DEFECT PROCESSING ROUTINE
602
OBTAIN DIGITAL IMAGE AND CURRENT FIELD OF VIEW
604
SELECT A MASK IMAGE TO APPLY
606
MERGE MASK IMAGE WITH INPUT IMAGE
608
RETURN
610

Fig. 8.

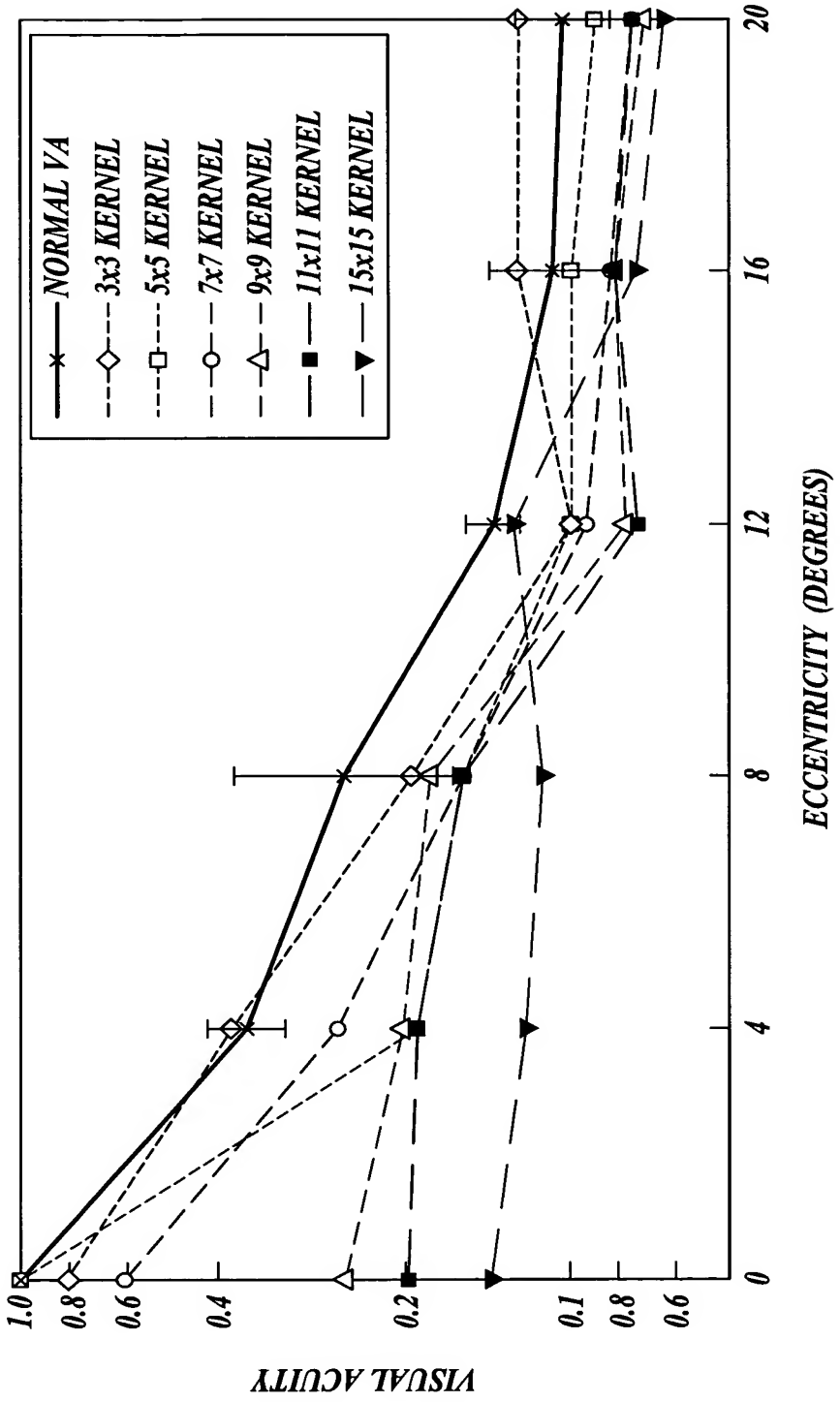
NORMAL VA
3x3 KERNEL
5x5 KERNEL
7x7 KERNEL
9x9 KERNEL
11x11 KERNEL
15x15 KERNEL
VISUAL ACUITY
1.0
0.8
0.6
0.4
0.2
0.1
0.8
0.6
0
4
8
12
16
20
ECCENTRICITY (DEGREES)

Fig. 9.